REMARKS/ARGUMENTS

Claims 1-53 are pending in this patent application. Claims 32-44 are withdrawn and claim 54 is cancelled. Claims 10, 32, 40, and 45 are amended to recite the approximate dimensions of the buried channel, as found in claim 1. No new matter is introduced by these amendments.

CLAIM REJECTIONS UNDER 35 USC § 103

Claims 1-9 are rejected as being obvious over Pourahmadi (US20020055167) or Anderson (US20010036672) in view of view of Chong (US6093330). Claims 10-14, 23/(10) [sic], 45-52 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Pourahmadi or Anderson, in further in view of Chong and Ackley (US6309602). Claims 15-22, 23/(17,22)[sic], and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourahmadi in view of Chong and Ackley as applied to claim 14, and further in view of Freeman (US6653124). Claims 25-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pourahmadi in view of Chong, Ackley and Freeman as applied to claim 24, and further in view of Kaplan (US6453928) and/or Webster (US6521188). Finally, Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pourahmadi in view of Chong and Ackley as applied to claim 52, and further in view of McDevitt (US20030064422).

Examiner admits that "Pourahmadi and Anderson, however, do not clearly indicate that the channels are "buried channels" (Office Action, page. 4), but relies on Chong in each rejection to teach buried channels as follows:

> Chong discloses a method for creating buried microfluidic channels in a semiconductor wafer. This is disclosed in column 9, line 66 to column 10, line 25. Column 4, lines 14-56 state that the channels are formed by first forming a via (Figure 2: 18) into a substrate, then applying an isotropic silicon etch through the via to produce a subsurface cavity, and finally filling in the via using an oxide layer. Column 5, lines 25-47 state that the channels each can have different dimensions one their lengths, are formed in any desired shape, and are located completely within the substrate material. Figures 4, 5, 8 and 9 disclose channels comprising aspect ratios (H/W) less than or equal to approximately one. *Id.*

Chong provides an example of channel size diameter ("the channel may be about 5 μm deep for a tunnel that is to be about 10 μm in diameter") (Col. 9, lines 49-54). Chong further suggests that the method can produce channels of "almost limitless dimensional variations" (Col. 7. line 7). However, detailed review of the methodology of Chong indicates that this statement is NOT correct, and that the channels are of very limited width and depth.

Chong teaches that large channels CANNOT be made by etching the substrate through a single via. As shown in Fig 6 and described at Col. 10, lines 29-32, if the channel is too wide the sealing material falls into the channel and an opening remains ("If the vias are too wide... the sealing material will fall through the via and via channel into the tunnel 38, leaving an opening 54 into the tunnel.").

Therefore, in order to form wider channels, Chong teaches to form smaller adjacent channels that join during the etch (see Fig. 11-18).

Such channels, however, still have very small depth.

Chong suggests forming a stacked channel (one on top of another) to extend the overall depth of an individual channel (Figure 9, Col. 11, lines 3-8).

However, this alternative is not suitable to create a channel as deep as 150 microns because the process would need to be repeated too many times and involves the very difficult step of making features on the bottom of a prior channel(s).

In fact, Chong does NOT go beyond describing two stacked channels and does NOT suggest that this process can be further iterated.

In fact, the task of deepening a channel by repeated subsequent etches will become increasingly difficult to accomplish as the depth increases. For example, alignment and dimensional control of the features are very poor away from the mask and plasma energy depends on etch depth, limiting the depth that can be attained. Further, depositing and anisotropically etching an oxide layer (necessary to create oxide sidewalls 12 around the vias) would be very difficult in the lowest channels, if possible at all.

Moreover, BOTH stacked and adjacent channels would have to be combined to achieve the claimed dimensions, because a single column of stacked channels would still be too narrow.

This is neither described by Chong, nor feasible.

One might attempt to combine two side by side channels as illustrated in Fig 15 of Chong and then form a third stacked channel in the bottom of each one as in Figure 9. However, this is not taught by Chong, and even if taught, would still not result in channels of the requisite depth and width, but only channels twice as wide and deep as that taught (e.g., twice 5X10 or 10X20 microns). Further, the oxide sidewalls 12 would remain in the interior, thus resulting in stacked channels communicating through small openings and not a single channel of the claimed depth and width.

Therefore, the solution disclosed by Chong cannot be used to create channels having the claimed dimensions. Without art teaching buried channels of approximately 200 μm wide by 150 μm deep, the *prima facie* case of obviousness is not made and withdrawal of all rejections under 35 U.S.C. §103 is sincerely solicited.

CONCLUSION

Applicants have addressed all of the Examiner's rejections. Applicants believe that the claims are now in condition for allowance and respectfully request that the Examiner grant such action. If any questions or issues remain in the resolution of which the Examiner feels will be advanced by a conference with the Applicants' attorney, the Examiner is invited to contact the attorney at the number noted below. No fees are believed to be due for this submission. However, the Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. 50-3420 reference 31175803-004001 (Valoir).

Dated: April 7, 2009

Respectfully submitted,

By /Tamsen Valoir/
Tamsen Valoir, Ph.D.
Registration No.: 41,417
BAKER & MCKENZIE LLP
Pennzoil Place, South Tower
711 Louisiana, Suite 3400
Houston, Texas 77002-2746
(713) 427-5007
Attorney For Applicants